

Advant[®] OCS
with Master software

Wiring Builder

Version 3.0/1

User's Guide

3BDS001712R0101



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Chapter 1 Introduction

1.1 Before You Begin

This manual describes the Wiring Builder. Wiring Builder is an optional tool to the Electrical Diagram Builder for Computer Aided Electrical Engineering of the AdvaBuild Engineering Software. With this Builder you can create and edit electrical wiring data, i.e. wires and cables assigned to physical connections between devices

This book is not intended to be the sole source of instruction for engineering tools. Those people involved in system engineering should attend the applicable system engineering courses offered by ABB.

The reader of this book should have good knowledge about engineering in general and the work flow used in his project.

1.2 Equipment Requirements

For a description of the system requirements consult the Release Notes of AdvaBuild Engineering Workplace and the Release Notes of the individual Builders.

1.3 How to Use This Book

This book is organized into chapters and sections as shown in Figure 1-1.

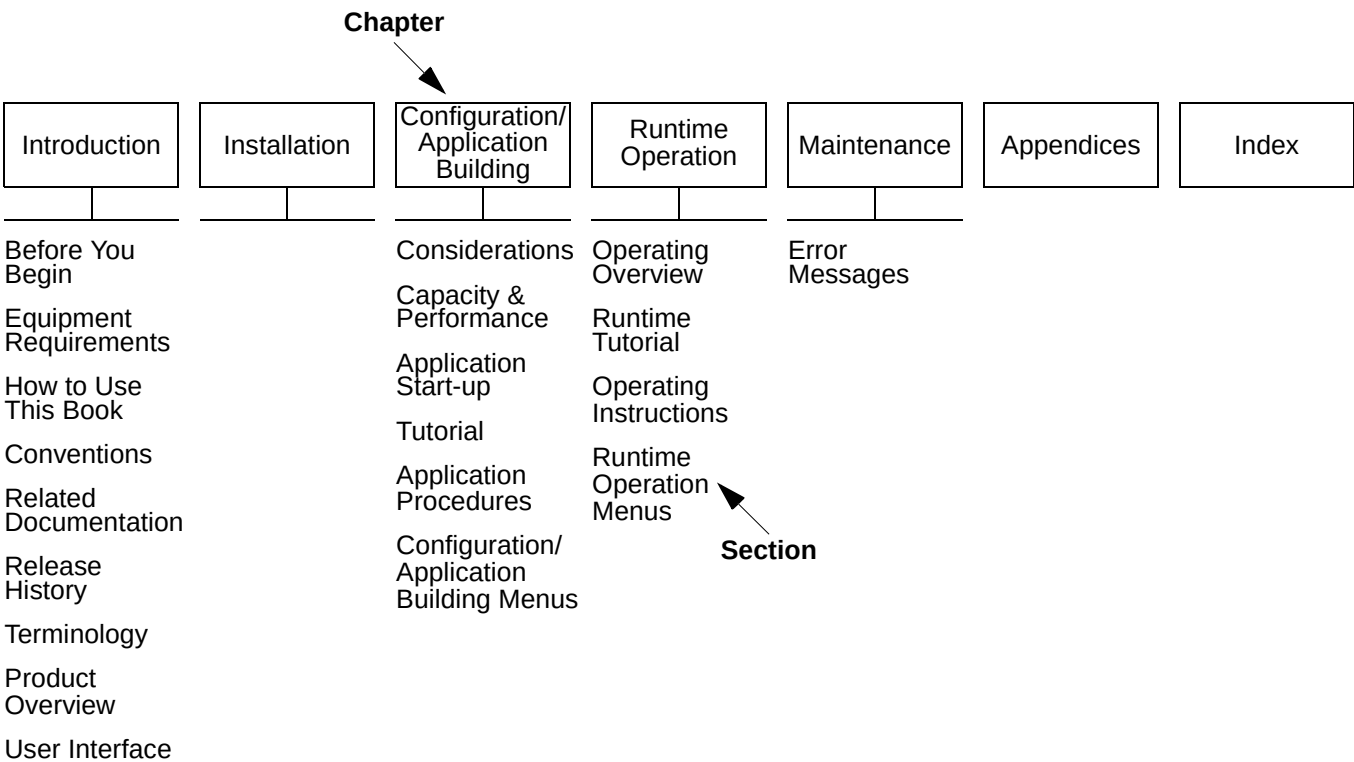


Figure 1-1. Organization of Manual

The main part of this users guide is placed in Chapter 3, Configuration/Application Building. Here you will find general considerations, application procedures, and as a reference part, a description of all menu commands.

1.4 Conventions

The names of referenced manuals are written in italics.

Keyboard interaction

When you read	You shall
File Copy	Open the File menu, choose the item Copy , and click it with left mouse button
Ctrl+M	Press the Ctrl key and the key labelled M simultaneously

1.5 Related Documentation

Table 1-1. Related Documentation

Title	Description
Structure Builder User's Guide	Describes how to create projects, Advant objects, structures and aspects and how to navigate in projects
Electrical Diagram Builder User's Guide	Describes how to handle electrical aspects of Advant objects
eIMaster interconnect User's Manual	Describes how to handle wiring data, i.e. wires and cables assigned to physical connections between devices
AdvaBuild Engineering Methods Reference Manual	Describes the principles of engineering based on the Advant object concept

1.6 Release History

Table 1-2 lists the major milestones in the development of the Wiring Builder

Table 1-2. Release History

Version	Description
3.0/0	This is the initial release of the Wiring Builder based on the new Advant Object Technology
3.0/1	This is the revision of the Wiring Builder to be compatible with Advant Engineering Workplace 1.1

1.7 Terminology

See Appendix A, Glossary of Terms

1.8 Product Overview

The Wiring Builder supports efficient wiring functions for electrical CAD in close connection with the Electrical Diagram Builder. The main functions are:

- Create logical nets from circuit diagrams automatically
- Change the sewing order for a subnet manually
- Assign wire numbers manually and/or use automatic rules for assigning wire numbers

- Assign wire articles manually and/or automatically
- Assign cable numbers manually
- Assign cable articles manually
- Create preliminary cables and wires
- Create different cable and connection reports
- Export cable/wire data in Partex format.

1.9 User Interface

The functions of Wiring Builder are implemented by Windows programs with the typical graphic user interface and look-and-feel of Windows programs.

The dialogs that will appear on the screen, normally have Help buttons. Clicking this button will open the Wiring Builder's on-line help, where you will get context-sensitively help to the actual topic.

Chapter 2 Installation

For the description how to install the Wiring Builder refer to the *Wiring Builder Release Notes*.

Chapter 3 Configuration/Application Building

3.0.1 AdvaBuild Engineering Software and Advant Object Technology

Please refer to the corresponding section in the Structure Builder User's Guide for an overview about the AdvaBuild Engineering Software, Advant Object Technology and the individual Builders.

3.0.2 Wiring Builder Overview

The Wiring Builder is based on elMaster interconnect working against the Electrical Diagram Builder Database.

NOTE

This version of the Wiring Builder is not integrated with the Aspect Request Broker, i.e. you cannot start the Wiring Builder from the Structure Builder on the specific Advant Objects.

The overview about the Wiring Builder is given in Figure 3-1.

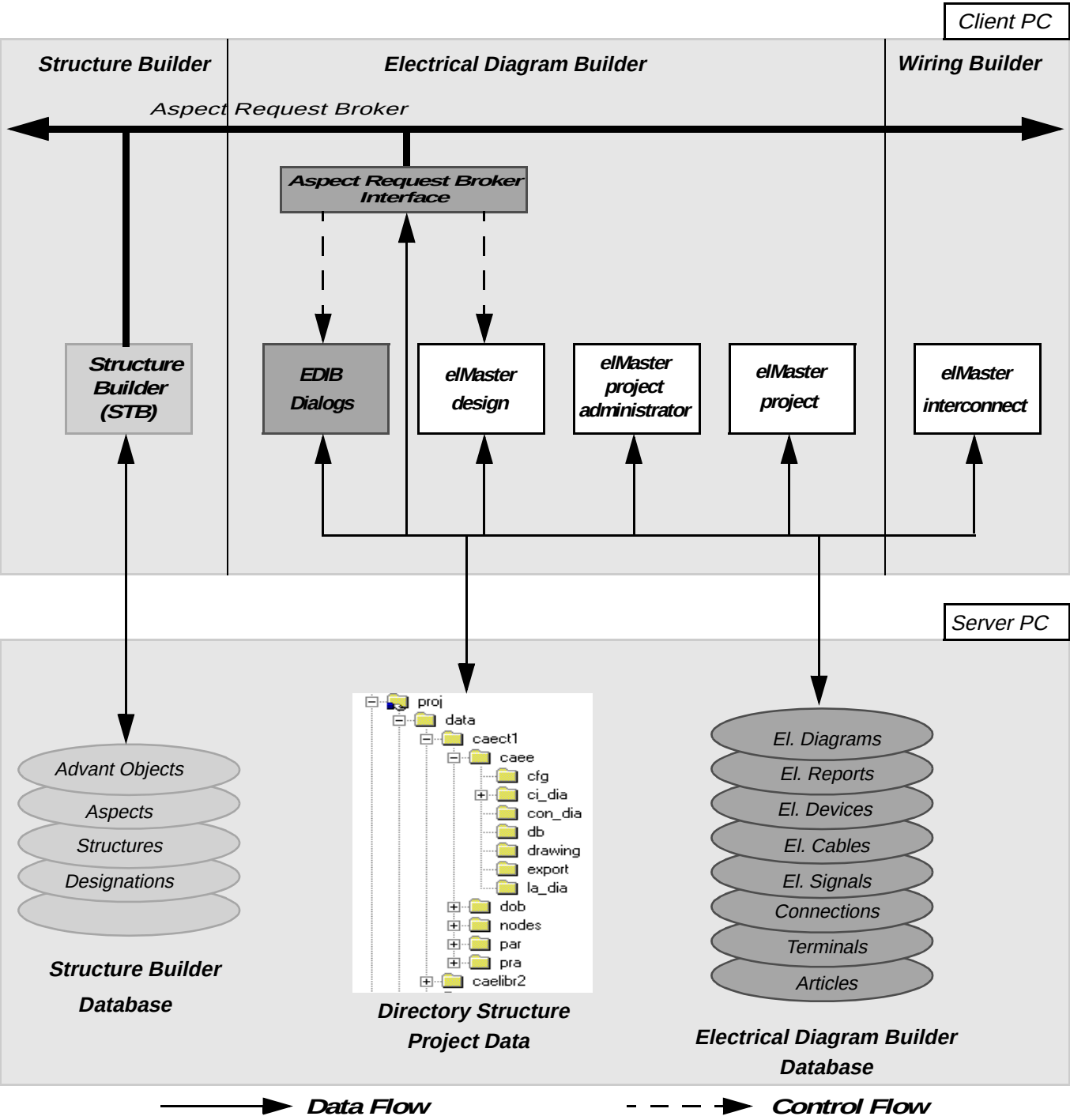


Figure 3-1. Wiring Builder - Overview

3.0.3 Design considerations

Refer to the corresponding chapter in the Electrical Diagram Builder User's Guide and the User's Manual for elMaster interconnect.

3.1 Capacity and Performance

Refer to the corresponding chapter in the Electrical Diagram Builder User's Guide and the User's Manual for elMaster interconnect.

3.2 Database Configuration

Refer to the corresponding chapter in the Electrical Diagram Builder User's Guide and the User's Manual for elMaster interconnect.

3.3 Application Start-up

Refer to the corresponding chapter in the Electrical Diagram Builder User's Guide.

3.4 Tutorial

Refer to Chapter 2 of the User's Manual of elMaster interconnect.

3.5 Application Procedures

3.5.1 Structure Builder Operations

3.5.1.1 Using Cables as Advant Objects

Cables can be handled within Structure Builder as any other Advant Object. From the wiring builder point of view the cable within the cable object is represented by an aspect of type El. Cable.

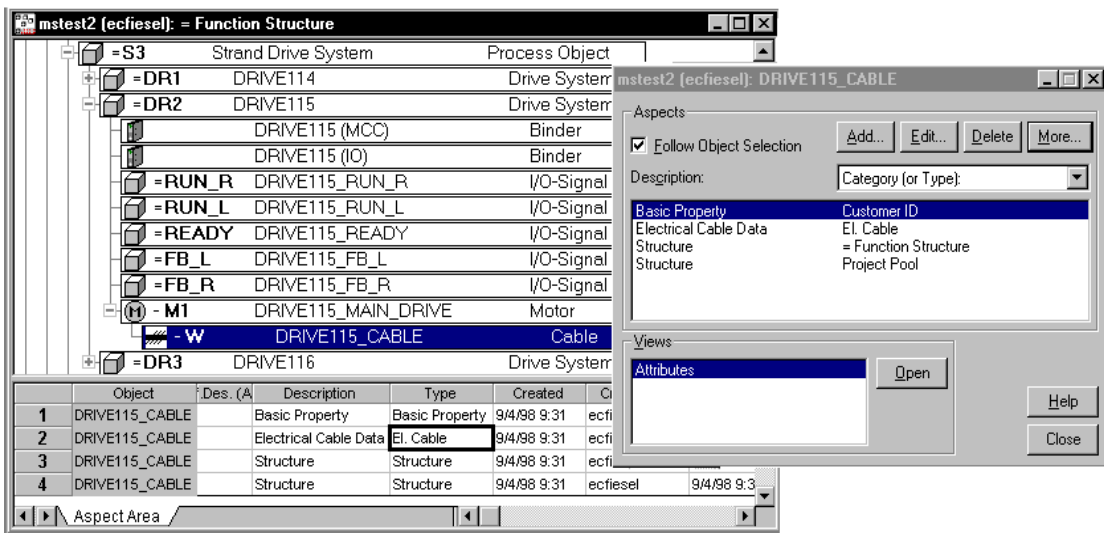


Figure 3-2. Cable as Advant Object within Structure Builder

NOTE

There is no must to have cables defined as Advant Objects. It is also possible to handle cables only locally within the Wiring Builder database using elMaster Interconnect.
But you will have profit including cables as Advant Objects when using the Parameter Builder import functionality to create bulk cables via import.

3.5.1.2 Editing Designations for Cable Objects

It must be clarified at first within a project, which kind of designations shall be used for cables. There is the choice between

- free cable numbers
Those can be defined via the Customer Id handled by Basic Properties aspects (Example in Figure 3-2: DRIVE115_CABLE)

- Product reference designations
those will be derived from reference designations defined via Structure aspects
(Example in Figure 3-2: =P1 . S3 . DR2 -M1 . w)

Note: within release 3.0 there are some drawbacks within elMaster concerning designations related to cables, which will be removed as soon as possible:

- within some Interconnect dialogs the visible part of designations is restricted to 12 characters
- product reference designations related to cables are updated to circuit diagrams always in absolute presentation

3.5.2 Parameter Builder Import Operations

3.5.2.1 Importing Cable Objects via Cable List

Advant Objects for cables can be created by importing a cable list according format described in Electrical Diagram Builder User’s Guide, section 3.6, “Import general Process Objects”..

CABLE_LIST : Table						
	Name	Description	LibRef1	LibR	FuncParent	MLocParent
▶	W114.1	Power Cable	W.PBGQ50		DRIVE114	Field Section
	W114.2	Control Cable	W.CBVH82		DRIVE114	Control Room 1.2.1
	W115.1	Power Cable	W.PBGQ40		DRIVE115	Field Section
	W115.2	Control Cable	W.CBVH82		DRIVE115	Control Room 1.2.1
	W116.1	Power Cable	W.PBGQ50		DRIVE116	Field Section
	W116.2	Control Cable	W.CBVH82		DRIVE116	Control Room 1.2.2
*						

Record: 1 of 6

Figure 3-3. Example for cable list import data

Using this type of import is recommended when using free cable numbers as identifier.

If within the used library project the cable is already related to a cable article and for the target project a corresponding cable article is available, the article reference and the cable cores will be included in cable

3.5.2.2 Including Cables in Standard Solutions

Advant Objects for cables can also be included in so called standard solutions. This means, there is for example a complete drive system created via import inc. all objects within function oriented substructure predefined within solution library..

Drive Systems	Resource
=DSC1	DS.C1 Drive System
DS.C1 (MCC)	Binder
DS.C1 (IO)	Binder
=RUN_R	DS.C1_RUN_R I/O-Signal
=RUN_L	DS.C1_RUN_L I/O-Signal
=READY	DS.C1_READY I/O-Signal
=FB_L	DS.C1_FB_L I/O-Signal
=FB_R	DS.C1_FB_R I/O-Signal
- M1	DS.C1_MAIN_DRIVE Motor
- W1	DS.C1_P_CABLE Cable
- W2	DS.C1_C_CABLE Cable
DS.TA	Drive System

Figure 3-4. Cables included in Standard Solutions

So the cables will automatically be included when creating instances of the whole solution during import according Electrical Diagram Builder User's Guide, section 3.6, "Import general Process Objects"

Using this type of import it is recommended to use product reference designations for the cables, because cable symbols included already in associated typical diagrams will automatically link to corresponding cables via reference designation principles.

3.5.3 Electrical Diagram Builder Dialog Operations

3.5.3.1 Selecting and Editing Aspects for Cables/Wires

Within Electrical Diagram Builder Dialogs there exist also a Cable dialog, which allows to browse for existing cables via Aspect Navigation dialog and edit cable data (see Electrical Diagram Builder User’s Guide, section 3.7, “Electrical Cable Dialog”).

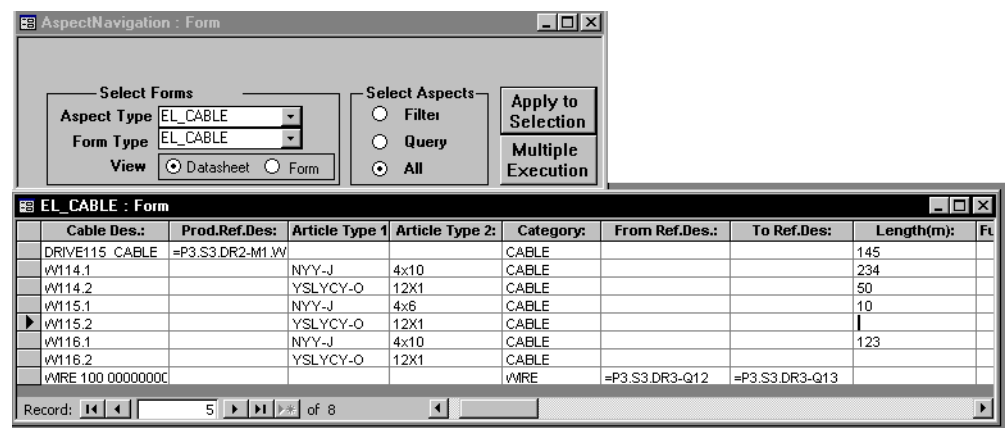


Figure 3-5. Dialog for Cables in datasheet view

NOTE

elMaster Interconnect creates internally for each location having a number of wires associated one object of category WIRE. This will also be included in the cable list. Deleting this will delete all related wires.

3.5.3.2 Selecting and Referencing Cable Articles

You can create also for cables an article reference (see Electrical Diagram Builder User’s Guide, section 3.6 “Selecting and referencing Articles”) This will create also the article related cable cores in the database, which can be used for wiring in Interconnect.

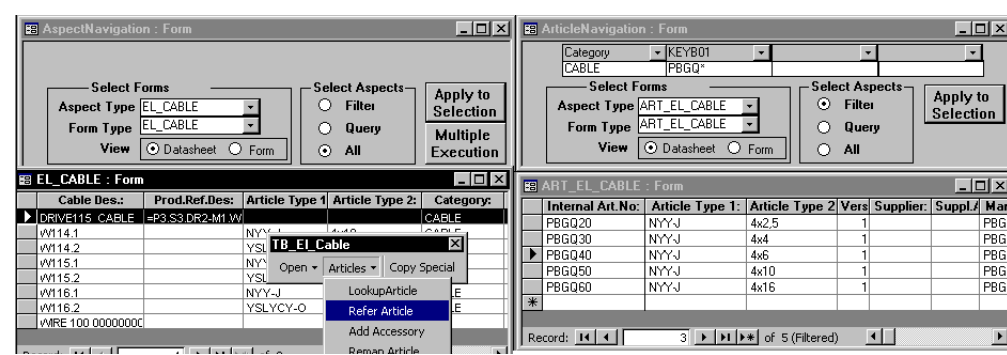


Figure 3-6. Creating article references for cables

3.5.3.3 Printing Cable Reports

Within Electrical Diagram Builder Dialog exist two standard reports provided as examples and made with MS Access report functionality

- a cable list report
- a summary cable list report

Cable No./Des	From	To	Quantity	Length (m)	Cable Code	Cable Type	Cable Dimension	Instruction	Remark	Routing
WI14.1	=P3.S3.DR1-M1	=P3.S3.DR1-X2	1	234	PBGQ50	NYFY-J	4x10	380V/50A		
WI14.2			1	30	CEVHE2	YSLVCY-O	12X1			
WI15.1	=P3.S3.DR2-M1	=P3.S3.DR2-X2	1	10	PBGQ40	NYFY-J	4x6	380V/50A		
WI15.2			1	238	CEVHE2	YSLVCY-O	12X1			
WI16.1	=P3.S3.DR3-M1	=P3.S3.DR3-X2	1	123	PBGQ50	NYFY-J	4x10	380V/50A		11, 12, 110, 234, 235
WI16.2			1	321	CEVHE2	YSLVCY-O	12X1			

Cable List				Approved	Cable List				=P3.S3
Bund. Ch.				Pay and	Bund. Ch.				
Rev				ABB				3BDS0067	
MSTES T2								Date: 10.1	
								Cost: 10.	

Figure 3-7. Example for a cable list report

Cable Type	Cable Dia.	No. of Cables	Total Length	Name	Technical Data	Weight	Cable Code ABB	Supplier	Supplier No.	Manufacturer
NYFY-J	4x10	2	357	Power Cable	POWER CABLE WITH PROTECTIVE CONDUCTOR	340g/km	PBGQ50			ABB
NYFY-J	4x6	2	155	Power Cable	POWER CABLE WITH PROTECTIVE CONDUCTOR	240g/km	PBGQ40			
YSLVCY-O	12X1	3	609	Verbindung zur Peripherie in Hydraulik (Analogtechnik)		190g/km	CEVHE2			ABB

Figure 3-8. Example for a summary cable list report

For more details see (see Electrical Diagram Builder User's Guide, section 3.6 "Editing Report Aspects")

Of course in parallel or instead the standard reports provided with elMaster Interconnect can be used.

3.5.4 Electrical Diagram Builder Drawing Operations

3.5.4.1 Creating Cables/Wires from Circuit Diagrams

Cables and its related core connections can directly be created within circuit diagrams via elMaster Design menu item **Conn/Ref | Design Data (Interconnect) | Cable Def.** The dialog procedure is indicated in figure below. For more details see elMaster design/interconnect manuals

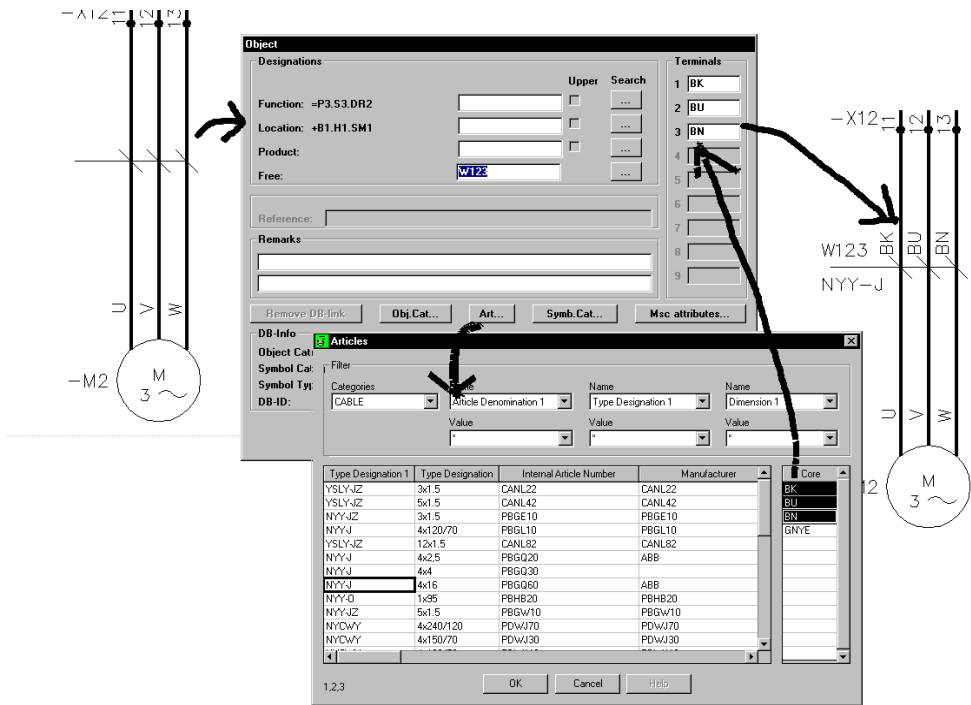


Figure 3-9. Creating cables from circuit diagrams

The cable object and its related connection information will then be available in the database after next **Save to database** on the diagram

3.5.4.2 Updating cable/wire information into Circuit Diagrams

A more database oriented approach for handling of cabling/wiring information in diagrams, which will also work with typical diagrams, is to

- insert just the cable or wire symbols on connecting lines in circuit diagrams
- save diagram to database
- assign cable cores or wires to connections via elMaster Interconnect **Edit Cores/Wires** dialog
- Update cable/wire information in circuit diagram.

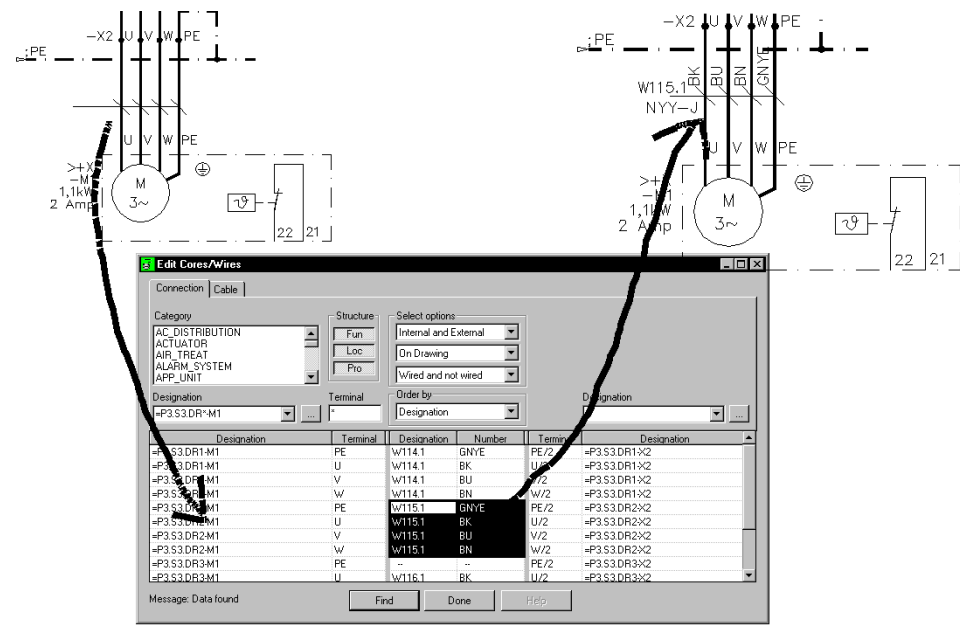


Figure 3-10. Updating cable information from database into circuit diagram

For more details see elMaster design/interconnect manuals

3.5.5 Wiring Builder Operations

Refer to Chapter 3 of the User's Manual of elMaster interconnect.

3.6 Configuration/Application Building Menus

3.6.1 e/Master Interconnect Dialogs

NOTE

The detailed description of the e/Master interconnect dialogs and menus is contained in Chapter 3 of the e/Master interconnect User's Manual. This chapter

only describes constraints when using this product integrated into the AdvaBuild Engineering Software.

3.6.1.1 Database Login Dialog

To start *e*/Master interconnect you have to double click the *e*/Master interconnect icon and to login to the project in the Electrical Diagram Builder database. Enter the project name in the fields **User Name**, **Password** and **Project identity** of the *e*/Master interconnect Database Login Dialog.

NOTE

The project name is the value you enter in the field **Project** of the **Open Project** dialog in the **Structure Builder** in **upper case letters**.



Figure 3-11. *e*/Master interconnect Database Login Dialog

3.6.1.2 Configuration | Project identity

WARNING

The function to change to another project after your database login cannot be used. You have to login separately to each project using the *e*/Master interconnect **Database Login** dialog.

Chapter 4 Runtime Operation

4.1 Operating Overview

Not applicable here.

4.2 Runtime Tutorial

Not applicable here.

4.3 Operating Instructions

Not applicable here.

4.4 Runtime Operation Menus

Not applicable here.

Chapter 5 Maintenance

5.1 Error Messages

Not applicable here

Appendix A Glossary of Terms

Administration

All activities covering user registration and creation, renaming, backup and restore, and deletion of projects are summarized under the topic administration or project administration.

AdvaBuild_engineers

Name of a Windows NT group created for working with **AdvaBuild Engineering Software**. Via this group the access rights of users are controlled. All members of this group can access project data. Therefore it is necessary to be assigned to this group.

Creation and deletion of projects is also controlled via the **AdvaBuild_engineers** group. But in addition you need the administrator password for the database user **EOSTB**.

Aspect

There are often several ways to look at an Advant object, depending on how you want to handle it. When for example an Advant object is representing a valve, then you might be interested in a drawing of that valve or in its loop. Then you may create with a corresponding Builder an CAEE aspect for the drawing and a control function aspect for the loop. The aspect stores the corresponding data. An aspect is an instance of an aspect type. Normally a Builder supplies some aspect types it is able to work on. You can start a Builder on an aspect by opening one of its views.

Aspect Attribute

An attribute holds descriptive data of an aspect.

Aspect Registry

The aspect registry is the database of the Aspect Request Broker. All aspects of a project are registered there.

Aspect System

The Aspect Request Broker communicates with a Builder via a so-called Aspect System Interface. When some Builders share an aspect system interface, these Builders are referred to as an aspect system. Therefore, an aspect system may consist of one or several Builders.

Aspect Type

Each Builder supplies several aspect types. Examples of aspect types are basic property aspect, structure aspect, or node control software aspect. An aspect type is designed for special tasks. These tasks will be performed by the corresponding Builders or aspect systems. An aspect type works as a template for the creation of aspects.

Attributes

see Aspect Attributes

Basic Property Aspect Type

The basic property aspect type is one of the aspect types supplied by **Structure Builder**. It holds a name and the type of an Advant object. As an Advant object may have several names, it may have several basic property aspects. You can refer to a specific one with the help of its name category, for example with Customer ID.

An Advant object may have for example a customer ID “Turbine A” and a location ID “Turbine A 2nd floor”.

Builder

A Builder is an application that can perform dedicated tasks on aspects. Builders can cooperate which each other via the **Aspect Request Broker**. Examples of Builders are: Structure Builder, Function Chart Builder, Parameter Builder.

Category

A category is a subtype of an aspect type. The name category for example is a subtype of a basic property aspect.

Child Object

Advant objects can be visualized in a pool or in a structure window. In a structure Advant objects may have a parent-child relation. A parent object may contain several child objects. In this way you can create a hierarchy of Advant objects. Child objects can be hidden when you compress the parent object.

Cooperating Mode

Builders can work in cooperating or independent mode. In cooperating mode Builders can communicate via the **Aspect Request Broker**. They are started by the **Structure Builder**, when you open a view of a selected aspect.

Copy

You can copy Advant objects between projects, structures, or within structures. In each case copy creates an additional Advant object.

Database

The data of **Electrical Diagram Builder** and **Wiring Builder** is stored in an **Oracle** database. To be able to access these data, a user must be registered as a database user. The registration can be performed with the **Project | Administration** menu command in the **Structure Builder**.

Advant object

Advant object Technology offers a methodology to model real world objects with Advant objects, aspects, and views. All entities you work with during the engineering process, like main plant equipment, components and devices, information entities like signals, or location entities like areas are referred to as Advant objects. Each Advant object may have several aspects.

EOSTB

EOSTB is a special database user (database administrator) which has the access rights to create and delete projects and to change user passwords. For project administration you have to log into the system as EOSTB user.

Menu

Menus are part of the menu bar. When you click with the mouse on a menu bar entry, the menu will be displayed, which shows one or several menu commands or a submenu. If you click on a menu command, the command will be executed.

Menu Bar

The menu bar is a bar below the main window's title bar. It holds the menu entries.

Move

To change the location of an Advant object in one of your structures, you can move it to another location in the same or in another structure.

Name Category

A basic property aspect type is subtyped by name categories. An example of a name category is Customer ID.

Object

see Advant object

Object Name

The name of an Advant object.

Object Type

The type of an Advant object. When you create a new Advant object, you can select among several types.

Parent Object

Advant objects can be visualized in a pool or in a structure window. In a structure Advant objects may have a parent-child relation. A parent object may contain several child objects. In this way you can create a hierarchy of Advant objects.

Paste

You can insert Advant objects, that you have previously copied to the clipboard with the **Edit | Copy** menu command, at the currently selected object.

Place

You can place an Advant object somewhere in a structure. When you place an Advant object, you do not create a new object. The object gets a new structure aspect containing the information about the new structure position.

Prefix

The prefix determines the type of a reference designation. Some prefixes are standardized:

- = Function reference designation
- - Product reference designation
- + Mounting location reference designation
- ++ Topological location reference designation

Within AdvaBuild Engineering Software the following designation is used:

- # OCS item designation

Besides these predefined prefixes, you are free to use your own prefixes.

Further on, the prefix will be used to concatenate relative reference designations.

Project Administration

Project administration covers all activities to administer projects, to assign database users, and to assign users to projects.

Project Global Data Aspect Type

At project creation time a project global data aspect will be created as an aspect of the project object. You cannot delete this aspect nor create another one. The project global data aspect type stores general information about a project.

Reference Designation

A reference designation designates an Advant object in a structure unambiguously (not checked by the system) with respect to its parent objects. Absolute reference designations consists of a concatenation of all relative reference designations.

Selected Pool

A selected pool is a special pool that is the result of a filter. It is a subset of the pool.

SQL Statement

SQL statements are used to specify filters for Advant objects. They are stored in files which you can select.

Status Bar

The status bar is a bar at the bottom of the application's main window. It holds some status information like keyboard settings.

Structure

Advant objects can be related to each other hierarchically. These relations are visualized in a structure window. You can create several structures depending on your needs. Some predefined structures are available.

Structure Aspect Type

When you locate an Advant object in a structure, it will get an corresponding structure aspect, which will hold the information about the position within the structure and the object's parent object.

Substructure

The part of a structure that holds all child objects of a certain (parent) object. It is also referred to as subtree.

Toolbar

The toolbar is a bar locate directly below the menu bar. It offers a quick access to some of the most commonly used menu commands.

User

A member of a project must be known by the database as user. Members of the Windows NT group **AdvaBuild_engineers** can be assigned as database users and can be mapped to projects.

View

An aspect may have several views. You can start a Builder on an aspect by opening one of its views. A node control software aspect as among others for example a node function chart and a node structure function chart view.



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